

Claim Listing

Claims 1-30 (cancelled).

31 (amended): A soft serve food product manufacturing, storage, and dispensing machine, comprising:

_____ a source of soft serve food product;

_____ a closed loop circulation system adapted to receive soft serve food product from the source, the closed loop circulation system comprising an emulsification assembly adapted to emulsify soft serve food product in the closed loop circulation system; and

_____ a dispensing head connected to the closed loop circulation system adapted to dispense soft serve food product from the closed loop circulation system;

in which the emulsification assembly comprises a plurality of emulsification chambers connected in series;

~~The machine of claim 29,~~ in which each emulsification chamber has a first end and a second end, an inlet connected to the first end, and an outlet connected to the second end; and

in which each emulsification chamber contains a rotatable whipping assembly extending from the first end to the second end of the emulsification chamber, the whipping assembly comprising first and second end pieces supporting a plurality of longitudinally extending rods connected between the end pieces, each rod being radially displaced from the axis of rotation of the whipping assembly.

32 (amended): A soft serve food product manufacturing, storage, and dispensing machine, comprising:

_____ a source of soft serve food product;

_____ a closed loop circulation system adapted to receive soft serve food product from the source, the closed loop circulation system comprising an emulsification assembly adapted to emulsify soft serve food product in the closed loop circulation system; and

_____ a dispensing head connected to the closed loop circulation system adapted to dispense soft serve food product from the closed loop circulation system;

in which the emulsification assembly comprises a plurality of emulsification chambers connected in series;

~~The machine of claim 29,~~ in which each emulsification chamber contains a rotatable whipping assembly comprising a plurality of longitudinally extending rotatable rods and a plurality of longitudinally extending stationary rods, each rod being radially displaced from the axis of rotation of the whipping assembly, at least some of the rotatable rods being radially displaced from the axis of rotation by unequal amounts.

Claims 33-37 (cancelled)

38 (new): A soft serve food product manufacturing, storage, and dispensing machine, comprising:

a source of soft serve food product;

a closed loop circulation system adapted to receive soft serve food product from the source, the closed loop circulation system comprising:

(a) an emulsification assembly having a first end and a second end, the emulsification assembly adapted to emulsify soft serve food product in the closed loop circulation system; and

(b) a pump connected between the first and second ends of the emulsification assembly, the pump being adapted to withdraw soft serve food product from one end of the emulsification assembly and to introduce the soft serve food product withdrawn from the one end of the emulsification assembly into the other end of the emulsification assembly, thereby circulating soft serve food product in the closed loop circulation system; and

a dispensing head connected to the closed loop circulation system adapted to dispense soft serve food product from the closed loop circulation system.

39 (new): The machine of claim 38, in which the emulsification assembly comprises at least one chamber containing a plurality of motor driven emulsification elements.

40 (new): The machine of claim 38, further comprising:
a refrigerated compartment enclosing the closed loop circulation system.

41 (new): The machine of claim 38, further comprising:
a refrigerated compartment enclosing the source of soft serve food product, the closed loop circulation system, and at least part of the dispensing head.

42 (new): The machine of claim 40, further comprising;
a refrigeration unit adapted to cool the refrigerated compartment to a predetermined temperature.

43 (new): The machine of claim 42, in which the predetermined temperature is just below the freezing temperature of the soft serve food product.

44 (new): The machine of claim 42, in which the predetermined temperature is between approximately 0° F. and approximately 26° F.

45 (new): The apparatus of claim 38, further comprising:
a clean in place system connected to the closed loop circulation system and adapted to clean the closed loop circulation system.

46 (new): The machine of claim 38, further comprising
at least one mix head adapted to introduce soft serve food product from the source into the emulsification assembly.

47 (new): The machine of claim 46, in which the at least one mix head is further adapted to introduce flavor and overrun gas into the emulsification assembly.

48 (new): The machine of claim 46, in which the at least one mix head is further adapted to introduce cleaning fluid into the emulsification assembly.

49 (new): The machine of claim 38, in which the emulsification assembly comprises a plurality of emulsification chambers connected in series.

50 (new): The machine of claim 49, in which the emulsification chambers define a serpentine path in the closed loop circulation system.

51 (new): The machine of claim 38, further comprising a freezing barrel in the closed loop circulation system.

52 (new): The machine of claim 45, further comprising a refrigerated compartment enclosing the closed loop circulation system and an unrefrigerated compartment enclosing the clean in place system.

53 (new): The machine of claim 39, in which the chamber contains a rotatable emulsification assembly comprising a plurality of rotatable axially extending emulsification elements that are radially displaced from the axis of rotation of the emulsification assembly.

54 (new): The machine of claim 53, in which the chamber further contains a plurality of stationary axially extending emulsification elements adapted to cooperate with the rotatable emulsification elements to provide a shearing action in the emulsification chamber.

55 (new): A soft serve food product manufacturing, storage, and dispensing machine, comprising:

- a source of soft serve food product;

- a closed loop circulation system adapted to receive soft serve food product from the source, the closed loop circulation system comprising an emulsification assembly adapted to emulsify soft serve food product in the closed loop circulation system; and

- a dispensing head connected to the closed loop circulation system adapted to dispense soft serve food product from the closed loop circulation system;

in which the emulsification assembly comprises a one or more emulsification chambers; and

in which each emulsification chamber contains a rotatable whipping assembly comprising a first plurality of rotatable emulsification elements and a second plurality of emulsification elements, each of the emulsification elements being radially displaced from the axis of rotation of the whipping assembly, the first and second pluralities of emulsification elements being arranged such that a shearing action is created between the first and second pluralities of emulsification elements when the first plurality of emulsification elements is rotated around the axis of rotation of the whipping assembly.